The statistical analysis of availability feature for payment cards with contactless payment function, cash and mobile payments in Poland. Results of own research

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ABSTRACT

Presently money is shifting from its analogue past to its digital future. The digitization of payments is transforming what both consumers and businesses expect from financial services. Although the Polish market of mobile payments is in the initial phase of development, it is one of the pioneering and leading in Europe and globally. The mobile payment industry in Poland is expected to reach US$ 26,893.9 million by 2025 (Poland Mobile Wallet 2019). The main purpose of this article is an attempt to answer the following question: how does "availability" feature influence consumer attention to use: payment cards without contactless payment function, cash and mobile payments?

Keywords: Payment card, cash, mobile payment.

1. INTRODUCTION

According to Schneider (2011), the development of cashless transactions through a greater use of electronic payments creates the potential to reduce the functioning costs of the payment system and to limit the scale of transactions made in the shadow economy with the use of cash money. It is worth to analyze, how selected feature influences the type of payment use (payment cards without contactless payment function, cash and mobile payments).

The main purpose of this article is an attempt to answer the following question: how does "availability" feature influence consumer attention to use: payment cards without contactless payment function, cash and mobile payments?

2. EVOLUTION OF MONEY

The evolution of payment instruments and the way individuals and businesses make daily payments has undergone enormous change in human history, particularly due to main innovations in payment systems in last decades (Rinaldi 2017).

Presently, money is shifting from its analogue past to its digital future (Reiss 2018). The digitization of payments is transforming what both consumers and businesses expect from financial services (Timofei 2017).

Credit cards and charge cards were introduced in the 1950s (Durkin 2000). A series of investments brought a fully electronic system to Visa in 1974. MasterCard made a similar investment shortly after (Rysman and Schuh 2016). The latest generation of innovative payment instruments such as contactless (Shishmanov 2014) and mobile payment has been launched taking advantage of technological enhancements in data communication, which tend to further improve payment efficiency by reducing transactions costs and simultaneously foster electronic ways of paying (Cocosila and Trabelsi 2015). The first introduction of mobile payment was in Helsinki, Finland in 1997. Two Coca Cola vending machines which were able to receive mobile payment through SMS were launched (Dahlberg et al. 2015).
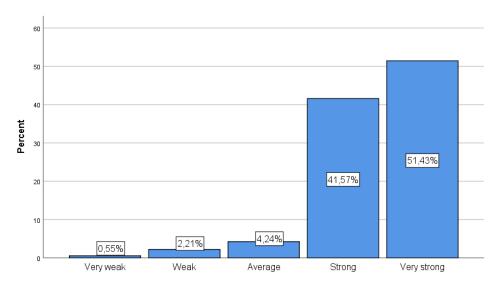
The next step in the evolution of payments gives the basis for differentiation of mobile fintech payment service trends. There are many mobile fintech payment service providers which can be classified (Apple pay, Samsung pay, LG Pay, Alipay, Wechat pay, Starbucks siren order, PayPal here, Stripe, Mobile payment with VISA, Citi Pay).

The empirical data obtained were statistically analysed with the use of cross tables. In order to determine the significance of differentiation between three independent measurement groups, ANOVA univariate analysis test was used (homogeneity of variance was examined by Leven test, used the Bonferroni Post Hoc Test and the Games-Howell Post Hoc Test). The associations between two ordinal variables were analysed with the use of Spearman's rank correlation (r). In all analyses, the level of statistical significance was $p < 0,05$.

The study was conducted among people living in Poland. The study was carried out in the period of February 2018 - September 2018. The number of respondents covered by the study is 1358 respondents. According to the information from the survey (1358 respondents), 60,53% (822 respondents) of the respondents are female, and 39,47% (536 respondents) are male.

Availability feature is very high ranked by the respondents (41,57% "strong" and 51,43% "very strong").
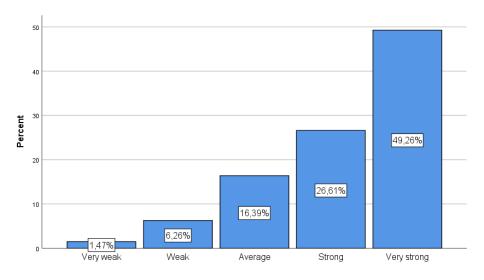
Figure 1. Rate the feature of payment cards with contactless payment function: Availability

Source: Own analysis.

For the respondents, the main advantage of cash is availability (49,26% "very strong" and 26,61% "strong").
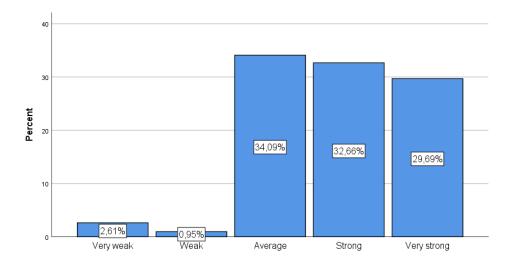
Figure 2. Rate the feature of cash: Availability

Source: Own analysis.

Respondents evaluate the availability as a feature of mobile payments well (29,69% "very strong" and 32,66% "strong"). Although there are answers with "average" opinion on that matter (34,09% "average").

Figure 3. Rate the feature of mobile payments (e.g. Google pay, Apple pay) : Availability
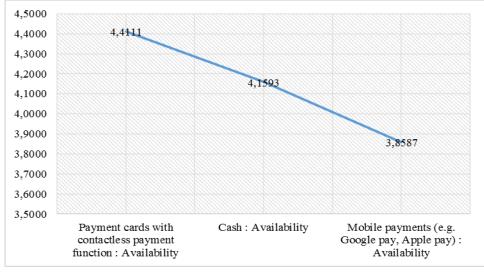

Source: Own analysis.

The table below presents the list of the means of payment features rated.

Table 1. Rate the features of: payment cards with contactless payment function, cash, mobile payments (Summary)

	N	Mean	Std. Deviation
Payment cards with contactless payment function : Availability	1085	4,4111	0,72557
Cash : Availability	1086	4,1593	1,00755
Mobile payments (e.g. Google pay, Apple pay) : Availability	842	3,8587	0,94446

Source: Own analysis.

Figure 4. Rate the feature: Availability

Source: Own analysis.

Ease of use is rated in a similar manner to availability. The most easy to use are payment cards with contactless payment function (M=4,6943), and the least are mobile payments (M=3,9656).

I calculated the relationship between them with the use of Spearman's rho correlation coefficient. For payment cards with contactless payment function, the strongest positive correlation is between speed and ease of use (r = 0,580; p = 0,001; N = 1086).

Table 2. The correlation between factors of payment cards with contactless payment function (Spearman's rho correlation coefficient)

		Card Convenience	Card Speed	Card Availability	Card Easeofuse	Card Safety
Card Availability	Correlation Coefficient	,462**	,527**	1,000	,506**	,168**
	Sig. (2-tailed)	,000	,000	.	,000	,000
	N	1080	1085	1085	1085	1085

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Own analysis.

For cash, the strongest positive correlation is between convenience and speed (r = 0,683; p = 0,001; N = 1086).

Table 3. The correlation between factors of cash function (Spearman's rho correlation coefficient)

		Cash Safety	Cash Convenience	Cash Speed	Cash Availability	Cash Ease of use
Cash Availability	Correlation Coefficient	,206**	-,066*	-,003	1,000	,393**
	Sig. (2-tailed)	,000	,029	,929	.	,000
	N	1086	1086	1086	1086	1085

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Source: Own analysis.

For mobile payment, the strongest positive correlation is between convenience and speed (r = 0,779; p = 0,001; N = 842).

Table 4. The correlation between factors of mobile payment function (Spearman's rho correlation coefficient)

		Mpayment Safety	Mpayment Convenience	Mpayment Speed	Mpayment Availability	Mpayment Ease of use
Mpayment Availability	Correlation Coefficient	,477**	,494**	,500**	1,000	,452**
	Sig. (2-tailed)	,000	,000	,000	.	,000
	N	842	842	842	842	842

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Own analysis

An analysis of variance (ANOVA) revealed that there are differences in the analyzed *monthly income* groups[1] ($F_{(2, 839)}$ = 4,991; p = 0,007) in the *availability* feature of cash.

The respondents with monthly income of 500 EUR and below (M = 3,31; SD = 1,10), rated this feature higher than the respondents with monthly income of 751-2500 EUR (M = 4,14; SD = 1,02) and the respondents with monthly income of 501-750 EUR (M = 4,02; SD = 0,94).
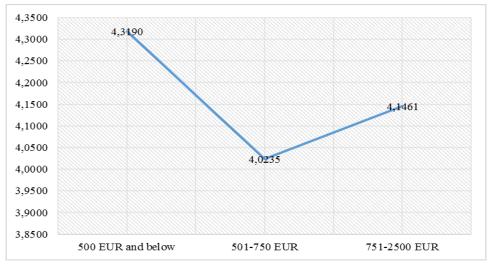
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[1] (500 EUR and below, 501-750 EUR and 751-2500 EUR).

The Games-Howell Post Hoc Test demonstrated that the differences between the groups were significant (p < 0,05) only between the respondents with monthly income of 500 EUR and below and 501-750 EUR (p = 0,003).

Figure 5. *Availability* **feature of cash (monthly income: 500 EUR and below, 501-750 EUR, 751-2500 EUR)**

Source: Own analysis.

An analysis of variance (ANOVA) revealed that there are differences in the analyzed *monthly income* groups[2] (F(2, 673) = 16,174; p = 0,001) in the *availability* feature of mobile payment.

The respondents with monthly income of 501-750 EUR (M = 4,12; SD = 0,95) rated this feature higher than respondents with monthly income of 500 EUR and below (M = 3,99; SD = 0,87) and respondents with monthly income of 751-2500 EUR (M = 3,62; SD = 1,09).

The Games-Howell Post Hoc Test demonstrated that the differences between the groups were significant (p < 0,05), except the respondents with monthly income of 500 EUR and below, and monthly income of 501-750 EUR (p = 0,339).

Figure 6. *Availability* **feature of mobile payment (monthly income: 500 EUR and below, 501-750 EUR, 751-2500 EUR)**

Source: Own analysis.

An analysis of variance (ANOVA) revealed that there are differences in the analyzed *professional activity* groups[3] (F(2, 669) = 3,977; p = 0,019) in the *availability* feature of mobile payment.
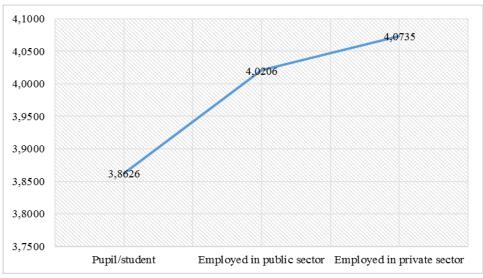
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[2] (500 EUR and below, 501-750 EUR and 751-2500 EUR).
[3] (500 EUR and below, 501-750 EUR and 751-2500 EUR).

The respondents employed in private sector (M = 4,07; SD = 0,98) rated this feature higher than the ones employed in public sector (M = 4,02; SD = 0,69) and pupils/students (M = 3,86; SD = 0,70).

The Bonferroni Post Hoc Test demonstrated that the differences between the groups were significant (p < 0,05) only between pupils/students and the respondents employed in private sector (p = 0,042).

Figure 7. *Availability* **feature of mobile payment (Pupil/student, employed in public sector and employed in private sector)**

Source: Own analysis.

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